

(No Model.)

L. H. SONDHEIM.
LEAD PENCIL.

No. 470,081.

Patented Mar. 1, 1892.

Fig. 2.

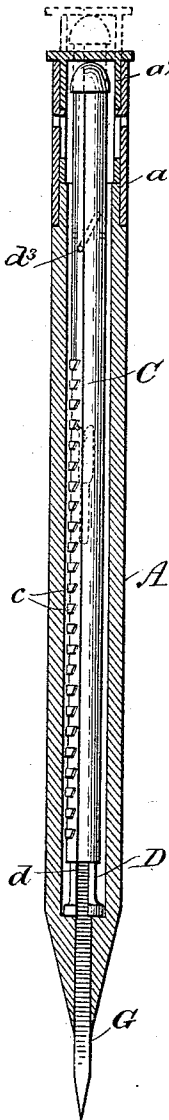


Fig. 1.

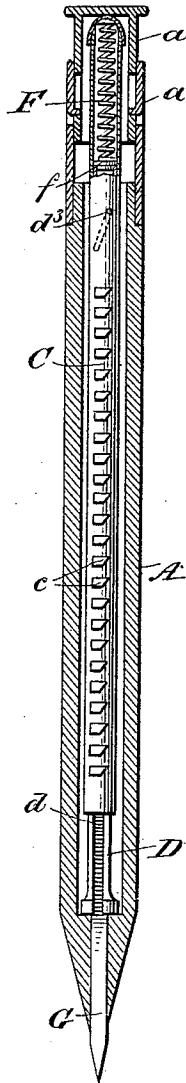


Fig. 3.

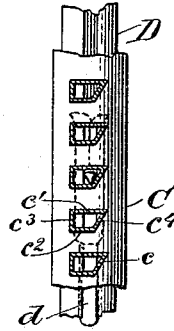


Fig. 4.

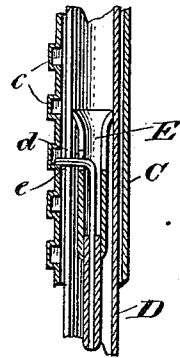


Fig. 5.

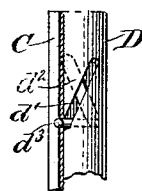


Fig. 6.

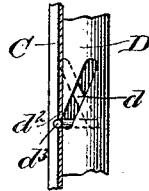


Fig. 7.

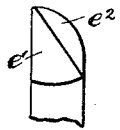


Fig. 8.



Fig. 9.

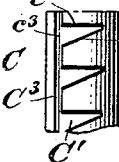


Fig. 10.



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UNITED STATES PATENT OFFICE.

LEWIS H. SONDHEIM, OF NEW YORK, N. Y.

LEAD-PENCIL.

SPECIFICATION forming part of Letters Patent No. 470,081, dated March 1, 1892.

Application filed April 24, 1891. Serial No. 390,283. (No model.)

To all whom it may concern:

Be it known that I, LEWIS H. SONDHEIM, of the city, county, and State of New York, have invented a new and Improved Lead-Pencil, of which the following is a full, clear, and exact description.

The invention relates to that class of pencils in which the lead is projected beyond the casing according as new writing-points are required and in which the case is not to be cut away, but retains its original length, provision being made for permitting the lead to be pushed back within the case to protect the pencil-point when not required for use.

The object of the invention is to provide an efficient, durable, and easily-operated pencil of this character.

The invention consists in the novel construction hereinafter particularly described, and defined in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a longitudinal sectional elevation of a lead-pencil embodying my invention, the lead-actuating devices being in the normal position. Fig. 2 is a like view with the end cap pressed forward for advancing the lead for projecting a new writing-point. Fig. 3 is an elevation of a portion of the feed-tube and lead-tube on a larger scale, with the feed-tube at its pawl-engaging recesses sectioned to better show the form of said recesses. Fig. 4 is a detail longitudinal sectional elevation of the feed-tube, lead-tube, and traveler. Figs. 5 and 6 are detail views illustrating the manner of arranging the guide-pin and guide-slot for giving rotary motion to the feed-tube, the said views showing opposite sides of the slotted lead-tube. Fig. 7 is a side view of a portion of the pawl of a traveler. Fig. 8 is an end view thereof, and Figs. 9 and 10 illustrate modifications in the feed-tube.

In a previous application filed by me on August 9, 1890, Serial No. 361,530, patented May 12, 1891, No. 452,242, there is disclosed a pencil having the general characteristics of the present one.

The pencil comprises a casing A, made, pref-

erably, of wood, tapered at its forward end, and provided with a ferrule *a* and end cap *a'*, the end cap being movable longitudinally in or on said ferrule and suitably held against displacement. In the bore of the casing is fitted a feed-tube C, within which is fitted a lead-tube D, the latter being slotted longitudinally, as at *d*, and projecting beyond the feed-tube at its lower end, said lower end being so fitted in the case A as to be capable of a slight rotary movement relatively to the latter. This latter feature has not to do with the practical operations of the pencil, but is a precautionary measure to prevent the splitting of the casing under abnormal conditions. Within the lead-tube D is loosely fitted a traveler E, provided with a spring-pawl *e*, which extends outward through the slot *d* of lead-tube D and is adapted to engage or be engaged by recesses, indentations, or openings *c* of the form hereinafter explained. A spiral spring F is arranged between the closed rear end of the feed-tube C and a shouldered plug or disk *f*, which is arranged at the outer end of the lead-tube D.

In my above-named prior application there is a single spiral or oblique guide-slot in the feed-tube and a guide-pin on the lead-tube projecting into the said slot for giving rotary motion to the feed-tube when the end cap of the ferrule is pressed forward to give a corresponding movement to the feed-tube.

In my present invention I form two diametrically-opposite oblique slots *d'* *d''* in the lead-tube D, and in the feed-tube C a pin *d'''* is secured to extend diametrically across the bore of the feed-tube and completely across the bore of the lead-tube through the opposite oblique slots *d'* *d''*. This construction permits the pin *d'''* to be conveniently riveted in place, and it is possibly a more stable arrangement than a single stud-pin soldered in place. It will readily be understood that the slot *d'* only is the guide-slot, the slot *d''* being merely to permit the necessary movement of the pin, and it is preferably made wider than the guide-slot *d'*, as shown in Figs. 5 and 6, so as not to permit the pin to contact with its walls. It will be seen that as the end cap *a'* is pressed inward the feed-tube C will respond and move inward and will engage by

its recessed portions c with the spring-pawl e of traveler E and advance the traveler and consequently the lead G to project the point of the lead beyond the casing. The spring F upon being released will in the usual manner return the cap a' and the feed-tube to their normal position, the recessed portions of the feed-tube clicking past the spring-pawl e . The traveler E , it is understood, is so fitted in the lead-tube as to have such a frictional contact with the latter as to prevent accidental retrograde movement of the traveler when the feed-tube is being retracted.

The present invention resides in the novel form of the feed-tube and the novel form of the spring-pawl.

The recesses of the feed-tube C in the present case form engaging and guiding edges or shoulders for the spring-pawl, which edges are not to be confounded with teeth formed along a longitudinal slot in the feed-tube, as in the present case there is no longitudinal slot, or if one is present in practice it is merely incidental to its manufacture and is not present to perform practical functions.

In the main figures, special reference being had to Figs. 3 and 4, the feed-tube is shown as provided with indentations, recesses, or pockets c , which are pressed or stamped outward from the bore, the material not being removed to form the recesses, but merely indented, as will be understood from Fig. 4. Inasmuch as it is the defining edges of the recesses that form the pawl-engaging edges, it is of no moment whether such edges be formed by indentations or by openings, the latter form being shown at C' C^2 in Figs. 9 and 10. The pawl-engaging edges in Figs. 3 and 4 consist of a straight transversely-extending rear edge c' , an opposite transversely-ranging front edge c^2 , and side edges c^3 c^4 . The side edge c^3 it is not essential to have straight, as it performs little or no function, and the front edge c^2 may be formed otherwise, it being only necessary that it click over the pawl e . The back edge c' is, however, preferably straight, since it is to engage the pawl in the forward movement of the feed-tube to progress the traveler and the lead. The side edge c^4 is inclined relatively to the edge c' , for a purpose presently explained.

In operation as the feed-tube is advanced in response to the forward movement of the end cap a' that edge c' immediately in the rear of the pawl e will strike the flat side e' of said pawl, and consequently the pawl and traveler will be advanced and the point of the lead projected. On the return movement of the feed-tube the forward edge c^2 will strike the rounded back e^2 of the pawl and depress or force the pawl inward, the several edges c^2 thus successively clicking past the pawl until the feed-tube reaches its normal rearward position. It is explained that when the cap a' is given a forward movement to the proper extent the guide-slot d' and the pin d^2 will have rotated the feed-tube to that extent that the defining

edges of the recesses or openings will have moved entirely clear of and be disengaged from the pawl e , this complete disengagement being facilitated by the inclination of the edges c' c^4 and by the rounded back e^2 of the pawl e . The pawl will now lie within the bore of the feed-tube beneath the material thereof at one side of the pawl-engaging edges, and on pressure being exerted on the point of the lead the lead and traveler will be caused to move inward until the lead is entirely within the case A . This inward movement of the lead may be effected by simply placing the point of the pencil against a desk or other resisting surface after pressing on the cap a' . When the lead is used up, the point of the traveler will be at the end of or project beyond the case and a new lead may be inserted, the new lead and the traveler being forced inward after disengaging the pawl in the manner just described above.

In Fig. 9 the openings C' are triangular, having the defining edges c' c^2 , as in those previously described, the third defining edge c^3 being a diagonal one, and like the side edge c^4 , previously mentioned, forms an acute angle with the edge c' . Further, in this figure is shown a joint which might be considered a longitudinal slot C^3 ; but the same is incidental to the manufacture of the tube, which is formed from an elongated strip, the longitudinal meeting edges forming the joint in question. The said joint is at that side of the recesses or openings which the pawl does not touch, and its presence or the presence of an equivalent joint has nothing to do with the pawl.

In Fig. 10 the edges c' c^3 are present; but they are joined by a curved line c^6 and to which the edge c' is tangential, thus forming the full equivalent of the acute angle previously mentioned.

It will be seen from the foregoing that the pawl-engaging edges meet at the point of escape of the pawl, or, in other words, they are of unbroken continuity at such point of escape instead of having an opening at such point, and any such slot or open joint as may be incidental to the manufacture of the tube will not affect the practical continuity of the pawl-engaging edges, as such joint will not prevent the forcing or compressing of the pawl within the bore of the feed-tube.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a pencil, the combination, with a lead-tube having a longitudinal slot and a traveler therein having a spring-pawl extending through said slot, of a feed-tube formed with a series of separate pawl-engaging edges and capable of a rotary movement to disengage the pawl, the said edges at the point of escape of the pawl being unbroken or continuous and presenting a shoulder at all sides of said recesses, substantially as described.

2. In a pencil, the combination, with a lead-tube having a longitudinal slot and a trav-

eler therein having a spring-pawl extending through said slot, of a feed-tube having a series of recesses or openings forming pawl-engaging edges, the pawl normally being engaged by said recesses, but lying within the bore of the feed-tube and beneath the surface of the said tube when the latter is rotated to the necessary extent, substantially as described.

3. In a pencil, the combination of a lead-tube having a longitudinal slot, a traveler therein having a spring-pawl extending through said slot, and a feed-tube having a series of pawl-engaging edges and capable of a rotary movement for disengaging the pawl, the said pawl-engaging edges of each recess at two adjacent sides thereof meeting at an acute angle at the point of escape of the pawl, substantially as described.

4. In a pencil, the combination of a lead-tube having a longitudinal slot, a traveler therein having a spring-pawl extending through said slot, and a feed-tube capable of rotary movement and having a series of separated recesses or openings, the defined edges of which recesses or openings extend in unbroken continuity at all sides and are adapted to engage the pawl, substantially as described.

5. In a pencil, the combination of a lead-tube having a longitudinal slot, a traveler

therein having a spring-pawl extending through said slot, and a feed-tube having recesses or openings the defining edges of which are adapted to engage the pawl, the said tube being capable of a rotary movement and the defining edge of the recesses at one side contacting with and riding over the pawl to compress the same within the tube when the latter is rotated, substantially as described.

6. In a pencil, the combination, with a lead-tube having a longitudinal slot and a feed-tube of practically unbroken peripheral continuity, of a traveler having a spring-pawl extending through the slot of the lead-tube to engage the feed-tube and adapted to be disengaged therefrom by a rotary movement of the feed-tube relatively to the lead-tube, substantially as described.

7. In a lead-pencil, the combination of a lead-tube having a longitudinal slot, a traveler therein having a spring-pawl extending through said slot, and a feed-tube having pawl-engaging recesses, the pawl having at its end a flat front side and a rounded back, substantially as described.

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Witnesses:

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